Course Syllabus

COURSE: **RADR 2333.200 (3:3:0), Advanced Medical Imaging**
SEMESTER: Fall 2015
CLASS TIMES: TR 9:30 – 10:45
INSTRUCTOR: Stacy Randel, MSRS
OFFICE: RC 512H
OFFICE HOURS: MTWR 1:00 – 3:00
OFFICE PHONE: (806)716-4628
E-MAIL: srandel@southplainscollege.edu
FACEBOOK: The radiologic technology program has a Facebook page at www.facebook.com/spcradiologictechnologyprogram. In addition to the South Plains college websites, this Facebook page will be used to keep students up-to-date on program activities, weather delays, South Plains college announcements and will help with program recruitment. "Liking" the radiologic technology program's Facebook page is not mandatory, nor are personal Facebook accounts in order to access this page.
BlackBoard: Blackboard is an e-education platform designed to enable educational innovations everywhere by connecting people and technology. This education tool will be used in this course throughout the semester.

"South Plains College improves each student's life."

GENERAL COURSE INFORMATION

COURSE DESCRIPTION

This course focuses on specialized imaging modalities. It includes concepts and theories of equipment operations and their integration for medical diagnosis.

COURSE OBJECTIVE

The student will be introduced to the basics of the available advanced imaging modalities used in the assessment of anatomy and diagnosis of disease processes. (F1,2,5,10,12;C5,6,7,8,15)

STUDENT LEARNING OUTCOMES

The student will:

1. Differentiate the specialized imaging modalities. (F1,10; C5,8,15,18,19)
2. Identify the advantages of the different advanced imaging modalities. (C5,8)
3. Explain the integration of the different advanced imaging modalities used in patient assessment. (F1,10;C5,6,7,15)
4. Identify and compare anatomy as imaged by different advanced imaging modalities. (F1,10; C5,8,15,18,19)

ACADEMIC INTEGRITY

It is the aim of the faculty of South Plains College to foster a spirit of complete honesty and a high standard of integrity. The attempt of any student to present as his or her own any work which he or she has not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offender liable to serious consequences, possibly suspension.

Cheating - Dishonesty of any kind on examinations or on written assignments, illegal possession of examinations, the use of unauthorized notes during an examination, obtaining information during an examination from the textbook or from the examination paper of another student, assisting others to cheat, alteration of grade records, illegal entry or unauthorized presence in the office are examples of cheating. Complete honesty is required of the student in the presentation of any and all phases of coursework. This applies to quizzes of whatever length, as well as final examinations, to daily reports and to term papers.

Plagiarism - Offering the work of another as one's own, without proper acknowledgment, is plagiarism; therefore, any student who fails to give credit for quotations or essentially identical expression of material taken from books, encyclopedias, magazines and other reference works, or from themes, reports or other writings of a fellow student, is guilty of plagiarism.

SCANS and FOUNDATION SKILLS

Refer also to Course Objectives. SCANS and Foundation Skills attached.

SPECIFIC COURSE INFORMATION

TEXT AND MATERIALS

Frank, Eugene., Merrill's Atlas of Radiographic Positioning and Procedures. 12th Edition, 2012. St. Louis, Missouri. The C.V. Mosby Co.

Bushong, Stewart C. Radiologic Science for Technologists. 10th Edition. 2013. Elsevier/Mosby.

ATTENDANCE POLICY

Class attendance is mandatory. Policies regarding absences coincide with those established for South Plains College as outlined in the SPC General Catalog.

It is extremely important that students arrive for class **on time. Tardiness** disrupts the instructor and the other students. Students who chronically arrive late will be counseled and if necessary, dropped from the class regardless of their grade point average. The student should be prepared for class at the scheduled class start time. **Students with perfect attendance will be awarded 2 points to their final grade at the end of the semester.**

Policies regarding absences coincide with those established for South Plains College as outlined in the SPC General Catalog.

INSTRUCTIONAL METHODS

The student will receive course information through a series of lectures, PowerPoint presentations and textbook assignments.

ASSIGNMENT POLICY

Reading assignments are the responsibility of the student. Reading assignments are provided in this syllabus. **The student must bring the applicable volume of Merrill's Atlas to every class.**

GRADING RUBRIC

Grades in this course will be determined using the following criteria:

Assessment Tool	Assessment Criteria	Percentage Score	Grade
MAJOR EXAMS 55%	✓ Exceptional unit content knowledge & understanding	91 – 100	A
	✓ Good unit content knowledge & understanding	83 – 90	B
	✓ Average unit content knowledge & understanding	75 – 82	C
	✓ Unacceptable unit content knowledge & understanding	0 – 74	F
FINAL EXAM 45%	✓ Exceptional course content knowledge & understanding	91 – 100	A
	✓ Good course content knowledge & understanding	83 – 90	B
	✓ Average course content knowledge & understanding	75 – 82	C
	✓ Unacceptable unit content knowledge & understanding	0 – 74	F

Course Grade:	A	91 – 100
	B	83 – 90
	C	75 – 82
	F	0 – 74

A grade average of C (75) must be maintained in all RAD TECH classes. Failure to do so will result in the student being dropped from the Program.

STUDENT EVALUATION

Students' acquired knowledge will be evaluated by a multiple choice and matching major exam for each class unit.

GRADING POLICY

The following guidelines will be followed regarding **MAJOR EXAMS**:

1. The student will complete the exam at the scheduled time.
2. The student must complete the exam within the allotted class time.
3. Make-up exams will be scheduled with the instructor
4. A student arriving late for an exam will not be allowed to take the exam if **any** student has completed the exam and left the room. This will also count as a tardy.
5. No cell phones or other electronic assistance, other than calculators, are allowed during exams.
6. According to SPC policy, **student's grade will not be given over the phone or by email to avoid the risk of a breach of confidentiality.**

The following guidelines will be followed regarding the **FINAL EXAM**:

1. The final exam will be comprehensive.
2. The final exam must be completed within the allotted time.
3. A student arriving late for an exam will not be allowed to take the final exam if **any** student has completed the exam and left the room.
4. No cell phones or other electronic assistance, other than calculators, are allowed during exams.
5. If a student is unable to take the final exam at the assigned time for any reason, the student may be given an incomplete for the course. After consulting the instructor, the student may be assigned a time to take the final exam and remove the incomplete. The final exam and course must be completed before the start of the spring semester.
6. According to SPC policy, **the student's grade will not be given over the phone or by email to avoid the risk of a breach of confidentiality.**

COMMUNICATION POLICY

Electronic communication between instructor and students in this course will utilize the South Plains College "My SPC" and email systems. Instructor will not initiate communication using private email accounts. Students are encouraged to check SPC email on a regular basis. Communication for this course is srandel@southplainscollege.edu

STUDENT CONDUCT

Students in this class are expected to abide by the standards of student conduct as defined in the SPC Student Guide and Radiologic Technology Program Student Handbook.

CELL PHONES

Cell phones are to be silenced during scheduled class, unless prior approval has been given from the instructor. **THIS INCLUDES TEXT MESSAGING.** Cell phones are to be used outside the classroom only.The phone number to the front desk is (806)716-4622 for emergencies. In the event a student misses class or lab for violation of this Program policy may jeopardize the student's ability to meet the required objectives of the course.

ACCOMMODATIONS

DIVERSITY STATEMENT

In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

DISABILITIES STATEMENT

ADA Statement

Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office through the Guidance and Counseling Centers at Reese Center (Building 8) 716-4606, or Levelland (Student Services Building) 716-2577.

COURSE OUTLINE

INSTRUCTIONAL UNIT: **Digital Fluoroscopy**
The student will:

1. Explain the fundamentals of digital fluoroscopy (F10;C5,6,15)
2. Differentiate between digital fluoroscopy conventional radiography. (F10;C5,6,15)
3. Identify the physical principles of digital fluoroscopy. (F10;C5,6,15)
4. Identify the significance of the digital fluoroscopy.
5. Identify the components of the digital fluoroscopy system. (F10;C5,6,15)
6. Discuss the safety of digital fluoroscopy.
7. Identify the imaging parameters of a digital fluoroscopy protocol. (F10;C5,6,15)
8. Discuss the positioning of the digital fluoroscopy patient.
9. Discuss the issues of patient monitoring during an digital fluoroscopy procedure.
10. Discuss the use of contrast media in digital fluoroscopy.
11. Identify the clinical applications of digital fluoroscopy.

INSTRUCTIONAL UNIT: **SECTIONAL ANATOMY OVERVIEW**
The student will:

1. Identify the imaging modalities that produce cross-sectional images. (C15)
2. Identify the advantages of cross-sectional images. (C15)
3. Identify and differentiate between the major imaging planes used in producing cross-sectional images. (C15)
4. Identify the characteristics of computerized tomography cross-sectional images. (C15)
5. Identify the characteristics of magnetic resonance cross-sectional images. (F1,10;C5)
6. Identify major anatomical structures in examples of CT and MRI cross-sectional images. (F1,10;C5)

TEXTBOOK READING ASSIGNMENT: **Merrill's Atlas, Vol. III, Ch. 30**

INSTRUCTIONAL UNIT: **COMPUTED TOMOGRAPHY (CT)**
The student will:

1. Explain the fundamentals of computed tomography (CT). (F10;C5,6,15)
2. Differentiate between computed tomography and conventional radiography. (F10;C5,6,15)
3. Identify and differentiate between the different generations of computed tomography scanners. (F10;C5,6,15)
4. Identify the technical aspects of the CT image. (F10;C5,6,15)
5. Identify the components of the CT system. (F10;C5,6,15)
6. Identify and differentiate between the diagnostic applications of CT.
7. Explain the use of contrast material used in CT.
8. Identify and explain the factors affecting the CT image quality. (F10;C5,6,15)
9. Identify and differentiate between the special features of various CT systems. (F10;C5,6,15)
10. Identify and explain the factors affecting radiation dose received from a CT procedure.

TEXTBOOK READING ASSIGNMENT: **Merrill's Atlas, Vol. III, Ch. 31**

INSTRUCTIONAL UNIT: **MAGNETIC RESONANCE IMAGING (MRI)**
The student will:

1. Explain the fundamentals of magnetic resonance imaging (MRI). (F10;C5,6,15)
2. Differentiate between magnetic resonance imaging and conventional radiography. (F10;C5,6,15)
3. Identify the physical principles of MRI signal production. (F10;C5,6,15)
4. Identify the significance of the MRI signal.
5. Identify the components of the MRI system. (F10;C5,6,15)
6. Discuss the safety of MRI.
7. Identify the imaging parameters of a MRI protocol. (F10;C5,6,15)
8. Discuss the positioning of the MRI patient.
9. Discuss the issues of patient monitoring during an MRI procedure.
10. Discuss the use of contrast media in MRI.
11. Identify the clinical applications of MRI.
12. Describe functional MRI. (F10;C5,6,15)

TEXTBOOK READING ASSIGNMENT: **Merrill's Atlas, Vol. III**, Chapter 32

INSTRUCTIONAL UNIT: **DIAGNOSTIC ULTRASOUND**
The student will:

1. Explain the principles of diagnostic ultrasound. (F10;C5,6,15)
2. Identify the properties of sound waves: acoustic impedance and velocity of sound.
3. Explain the process of transducer selection in diagnostic ultrasound. (F10;C5,6,15)
4. Differentiate between volume scanning and three-dimensional and four-dimensional ultrasound imaging.
5. Identify the characteristics of the sonographic image.
6. Identify the clinical applications of diagnostic ultrasonography.

TEXTBOOK READING ASSIGNMENT: **Merrill's Atlas, Vol. III**, Chapter 33

INSTRUCTIONAL UNIT: **NUCLEAR MEDICINE**
The student will:

1. Explain the principles of nuclear medicine, including positron emission tomography (PET). (F10;C5,6,15)
2. Identify the important factors that distinguish PET from other nuclear imaging procedures and other radiologic procedures. (F10;C5,6,15)
3. Identify the radionuclides used for conventional nuclear medicine.
4. Identify the positron-emitting radionuclides used in PET.
5. Identify the physical principles of nuclear medicine. (F10;C5,6,15)
6. Discuss radiation safety in nuclear medicine.
7. Identify the components of the nuclear medicine system. (F10;C5,6,15)
8. Identify and differentiate the variety of diagnostic imaging methods of nuclear medicine. (F10;C5,6,15)
9. Identify the clinical applications of nuclear medicine.
10. Identify the clinical applications of positron emission tomography.
11. Define the following terms associated with nuclear medicine:

TEXTBOOK READING ASSIGNMENT: **Merrill's Atlas, Vol. III**, Chapter 34
INSTRUCTIONAL UNIT: **MAMMOGRAPHY**
The student will:

1. Explain the fundamentals of mammography (F10;C5,6,15)
2. Differentiate between mammography and conventional radiography. (F10;C5,6,15)
3. Identify the physical principles of mammography. (F10;C5,6,15)
4. Identify the significance of the mammography.
5. Identify the components of the mammography system. (F10;C5,6,15)
6. Discuss the safety of mammography.
7. Identify the imaging parameters of a mammography protocol. (F10;C5,6,15)
8. Discuss the positioning of the mammography patient.
9. Discuss the issues of patient monitoring during an mammography I procedure.
10. Discuss the use of interventional procedures in mammography.
11. Identify the clinical applications of mammography.

FOUNDATION SKILLS

BASIC SKILLS–Reads, Writes, Performs Arithmetic and Mathematical Operations, Listens and Speaks
F-1 Reading–locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.
F-2 Writing–communicates thoughts, ideas, information and messages in writing and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.
F-3 Arithmetic–performs basic computations; uses basic numerical concepts such as whole numbers, etc.
F-4 Mathematics–approaches practical problems by choosing appropriately from a variety of mathematical techniques.
F-5 Listening–receives, attends to, interprets, and responds to verbal messages and other cues.
F-6 Speaking–organizes ideas and communicates orally.

THINKING SKILLS–Thinks Creatively, Makes Decisions, Solves Problems, Visualizes and Knows How to Learn and Reason
F-7 Creative Thinking–generates new ideas.
F-8 Decision-Making–specifies goals and constraints, generates alternatives, considers risks, evaluates and chooses best alternative.
F-9 Problem Solving–recognizes problems, devises and implements plan of action.

F-10 Seeing Things in the Mind's Eye–organizes and processes symbols, pictures, graphs, objects, and other information.
F-11 Knowing How to Learn–uses efficient learning techniques to acquire and apply new knowledge and skills.
F-12 Reasoning–discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

PERSONAL QUALITIES–Displays Responsibility, Self-Esteem, Sociability, Self-Management, Integrity and Honesty
F-13 Responsibility–exerts a high level of effort and perseveres towards goal attainment.
F-14 Self-Esteem–believes in own self-worth and maintains a positive view of self.
F-15 Sociability–demonstrates understanding, friendliness, adaptability, empathy and politeness in group settings.
F-16 Self-Management–assesses self accurately, sets personal goals, monitors progress and exhibits self-control.
F-17 Integrity/Honesty–chooses ethical courses of action.

SCANS COMPETENCIES

C-1 **TIME** - Selects goal - relevant activities, ranks them, allocates time, prepares and follows schedules.
C-2 **MONEY** - Uses or prepares budgets, makes forecasts, keeps records and makes adjustments to meet objectives.
C-3 **MATERIALS AND FACILITIES** - Acquires, stores, allocates, and uses materials or space efficiently.
C-4 **HUMAN RESOURCES** - Assesses skills and distributes work accordingly, evaluates performances and provides feedback.

INFORMATION - Acquires and Uses Information
C-5 Acquires and evaluates information.
C-6 Organizes and maintains information.
C-7 Interprets and communicates information.
C-8 Uses computers to process information.

INTERPERSONAL–Works with Others
C-9 Participates as a member of a team and contributes to group effort.
C-10 Teaches others new skills.
C-11 Serves Clients/Customers–works to satisfy customer's expectations.
C-12 Exercises Leadership–communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
C-13 Negotiates-works toward agreements involving exchanges of resources; resolves divergent interests.
C-14 Works With Diversity–works well with men and women from diverse backgrounds.

SYSTEMS–Understands Complex Interrelationships
C-15 Understands Systems–knows how social, organizational, and technological systems work and operates effectively with them.
C-16 Monitors and Corrects Performance–distinguishes trends, predicts impacts on system operations, diagnoses systems performance and corrects malfunctions.
C-17 Improves or Designs Systems–suggests modifications to existing systems and develops new or alternative systems to improve performance.

TECHNOLOGY–Works with a Variety of Technologies
C-18 Selects Technology–chooses procedures, tools, or equipment, including computers and related technologies.
C-19 Applies Technology to Task–understands overall intent and proper procedures for setup and operation of equipment.
C-20 Maintains and Troubleshoots Equipment–prevents, identifies, or solves problems with equipment, including computers and other technologies.